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IMPROVED TELESCOPE

CLAIMS

1) Space telescope comprising:

a) a first storey containing a membranous mirror and said mirror's actuating and protecting devices;

b) a second storey located at the focal plane of the mirror and containing means for observing the image;

c) a third storey located at the curvature center of the mirror, and containing means to explore the shape of the mirror;

d) a accessory light device lighting the object scrutinized by the optical system;

e) a mean to render jointly the three storey and the accessory light device.

characterised in that:

f) the mirror and its actuating device are constituted by concentric membranes, free at their periphery and tied by their central part, directly or by a intermediate device;

g) the membranes, or only the actuating membrane, have surface devices, conductors, insulators, and semi conductors, separated, contiguous or stacked, constituting integrated circuits, and surface electrodes, having particularly coils shape..

2) Telescope according to the claim 1, characterised in that a winding centred on the optical axis of the telescope surrounds the means of uniting the three storeys at the level of the mirror storey, and/or where a wiring or a magnet with axis on same optical axis are tied to the mirror storey of said telescope.

3) Telescope according to claim 1, characterised in that the means tying the storeys is a blind cylinder (2) rigidified by tubes under pressure and by polymerization of a resin impregnating the said cylinder and tubes.

4) Telescope according to claim 1, characterised in that the blind cylinder (2) tying the three telescope storeys together is placed into a protecting jacket (3).

5) Telescope according to claim 1, characterised in that the blind cylinder (2) and the protecting jacket (3) are first folded by telescopic invagination then by folding spokes wise and scrolled along radiuses.

6) Telescope according the claim 1, characterised in that closed tubes associated by links to jacket (3) or to blind cylinder (2) of the telescope are folded by telescopic invagination at the same time as cylinder (2) or jacket (3), and have apertures through which a pressurised gas can be introduced to provoke their extension.

7) Telescope according to claim 1, characterised in that the blind cylinder (2) of the telescope (1) and the protecting jacket (3) are slightly conical or bi-conical.

8) Telescope according to claim 1, characterised in that windings symmetrically centred on the optical axis of the telescope (1) are fixed on the blind cylinder (2) at the level of the mirror storey.

9) Telescope according to claim 1 characterised in that the means of folding are made of linear vertical elements associated by pairs, vertically mobile from an upper position to a low position, and integral of radial displacement means, moving continuously from a position far from the centre to a position closed to the centre.

10) Telescope according to claim 1 characterised in that the mean recognising the shape of the mirror, situated at the control stage and defining the optical axis of the mirror, moves inside a circle centred on the optical axis of the telescope, and perpendicularly to this axis.

11) Telescope according to claim 1, characterised in that the means adjusting the mirror and its actuating membrane are gimbal or ball-joint mounted, and provided with actuators.

12) Telescope according to claim 1, characterised in that the means controlling the mirror modify continuously the generating line of the mirror, while maintaining the shape of revolution of the mirror, in such a manner that at each instant exists a circle of minimum aberration centred on the optical axis and moving from the optical axis towards the outside or vice versa.

13) Telescope according to claim 1, characterised in that one or several photo-electric matrices scan the circle of minimum aberration.

14) Telescope according to claim 1, characterised in that the mirror and its actuating membrane are made totally or partially of a material having shape memory.

15) Telescope according to claim 1, characterised in that, for their folding, the mirror and the actuating membrane are made quasi flat by a succession of centred distorsions, alternately concave and convex.

16) Telescope according to claim 1, characterised in that the means which unite the several storeys is a tripode pyramidal frame the triangular base of which is contained within a circle distinctly smaller than the mirror.

17) Telescope according to claim 1, characterised in that the frame is made from flexible tubes having a complex annular structure comprising, going from the outside to the inside :

a) a textile layer for absorbing the solar radiation,

b) an insulating layer,

c) a textile layer impregnated with a resin curing under temperature or under the effect of a gas,

d) an exothermic coating reacting under the effect of a gas.

18) Telescope according to claim 1, characterised in that the membranes constituting the mirror and the actuating membrane are obtained by depositing a substance on a liquid contained in a vertical container rotating around its vertical axis.

19) Telescope according to claim 1, characterised in that the membranes have peripheral and/or central flanges shaped on the walls of the container.

20) Telescope device according to claims 1 and 6, characterised in that electrodes centered on the axis of rotation of the container create an electric field distorting the shape of the surface of the rotating liquid.

21) Telescope according to claims 1 and 6, characterised in that a ferroelectric substance exists in the bottom of the container.

22) Telescope according to claim 1, characterised in that an

accessory light device is located on the optical axis of the system, at the level of mirror storey.

23) Telescope according to claim 1, characterised in that a second convex semi transparent parabolic mirror the axis of which is the same as the axis of main mirror, the convex part of which is oriented towards the main mirror, and its virtual focus confounded with the real focus of the main mirror.

24) Telescope according to claims 1 and 23 characterised in that the secondary mirror is made from a parallel faces parabolic diopter the convex face of which is a semi-reflecting coating.

25) Telescope according to claim 1, characterised in that a third parabolic mirror, the axis of which is the same as the optical axis of main mirror, the convex part of which is oriented towards this main mirror, has it focal point confounded with the one of said main mirror, or very slightly more distant from this said main mirror.

26) Telescope according to claim 1, characterised in that the mean receiving the image formed by the main mirror is a CCD transparent or semi transparent matrix able to receive on its back a luminous signal.

27) Telescope according to claims 1 and 26, characterised in that a second CCD matrix is put on the back of the first, when this is opaque.

28) Telescope according to claim 1, characterised in that one spherical concave mirror is tied to one of the storeys, and in that the curvature center of this mirror is located in another storey.

29) Telescope according to claim 1 and 28, characterised in that there are two or several mirrors of the claim 28, symmetrically located around the optical axis of the space optique system.

30) Telescope according to claim 30 characterised in that a cut band filter protects the image-receiving photo-electric matrix from the laser beam having crossed the secondary semi-transparent mirror.

31) Telescope according to claims 1 and 23 characterised in that the centre of the secondary mirror is totally reflecting onto a

surface which is the projection of the surface of the photo electric image-recieving matrix on the surface of the mirror.

32) Telescope according to claim 1 characterised in that a large size circular screen, perpendicular to the optical axis of the telescope, and centred on this axis, is located beyond or on the side of the sagittal analyser, and in the later case has in its centre an annular hole of the same size as the said sagittal analyser.

33) Telescope according to claim 1, characterised in that a photo-electric matrix, preferably a portion of a concave sphere, placed slightly beyond the theoretical sagittal segment of the main mirror, centred on the theoretical optical axis of the telescope, its concave side turned towards the sagittal segment, and its centre of curvature being preferably at the middle of the sagittal segment.

34) Telescope according to claim 1, characterised in that a movable opaque screen perpendicular to the optical axis of the telescope, having in its central portion a hole situated on this optical axis, and moving in parallel with said optical axis in such a way that the central hole scans the sagittal segment.

35) Telescope according to claims 1 and 28 characterised in that the face of the screen turned towards the main mirror is covered with a photo-electric matrix.

36) Telescope according to claims 1 and 28 characterised in that the movable screen is replaced by several stacked polarised cells, all of them having at their centre an inactive zone, theses cells being successivly activated in such a way as to simulate the displacement of the screen.

37) Telescope according to claims 1 and 25 characterised in that the spherical matrix has a central hole in which is placed a cylinder the axis of which is the same as the optical axis, and which is mobile along this axis, and having at the end which is turned towards the sagittal segment, a photo-electric matrix.

38) Telescope according to claim 1, characterised in that, in the case of an open frame, protecting parabolic membrane, constituted of resin impregated fibers, having peripheral flange exceeding

flanges of the actuating membrane and mirror, are located beyond the said actuating membrane.

39) Telescope according to claim 1, characterised in that hearth bound telescope mirror is free at its periphery and electrically connect at a rigid support by its central flange.

40) Telescope according to claims 1 and 41, characterised in that the actuating membrane is applied onto the surface of a rigid support, or constitute the superficial layer of this rigid support.

41) Telescope according to claims 1 and 41, characterised in that annular covers fitted with inside surface devices electrically linked with the rigid support, are laid onto the centre and periphery of said rigid support, said covers covering the periphery and the centre of the mirror.

42) Telescope according to claims 1 and 41, characterised in that a cylindrical jacket, made of soundproofing materials, closed at its upper end by an optical membrane, is put under pressure in such a way as to stretch the optical membrane that closes it.

43) Telescope according to claim 1, characterised in that the envelope and the jacket are made of two separated elements, the upper cylindrical element, open and comprising the focal storey and the centre of curvature storey, and the lower cylindrical element, closed at one end and comprising the mirror storey.